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EXAMINER	
THOMPSON, JAMES A	

ART UNIT	PAPER NUMBER
2625	

DATE MAILED: 07/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/938,492	MEHIGAN, MICHAEL	
	Examiner	Art Unit	
	James A. Thompson	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4 and 6-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4 and 6-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 August 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 03 April 2006 has been entered.

Response to Arguments

2. Applicant's arguments filed 03 April 2006 have been fully considered but they are not persuasive.

Regarding page 6: A bold character, which corresponds to the first dithering technique, is clearly thicker and of higher density than a non-bold character, which corresponds to the second dithering technique, as set forth by Kanno (US Patent 4,998,122). A bold character has a darker density and greater thickness than a non-bold character, as is well-known in the art.

Regarding page 7, line 1 to page 8, line 16: As discussed in detail in the Advisory Action dated 13 February 2006 and mailed 21 February 2006, while the clustered-dot and dispersed-dot techniques are taught separately in the Background section of Ostromoukhov, the proper application of each technique and the reasons why one of ordinary skill in the art at the time of the invention would use each technique are also described. Kanno teaches processing the line-like part of the halftone image by a

first dithering technique (column 5, lines 3-6 and lines 21-27 of Kanno) or a second dithering technique (column 9, lines 36-43 of Kanno) according to the predetermined property of the line-like part (column 4, lines 19-22 of Kanno). Ostromoukhov teaches that clustered dot dithering does not render the smaller image details very well (figure 1 and column 2, lines 4-7 of Ostromoukhov) and dispersed dot dithering is better for rendering the smaller image details (column 1, lines 45-47 of Ostromoukhov), but can have certain banding artifacts (figure 2 and column 1, lines 50-54 of Ostromoukhov). Clustered-dot dithering is taught by Ostromoukhov to be advantageous for a restricted number of gray levels (column 2, lines 1-7 of Ostromoukhov) and dispersed-dot dithering is taught by Ostromoukhov to be advantageous for fine details (column 1, lines 45-47 of Ostromoukhov). Since Kanno already teaches that different dithering techniques can be selected among for the purpose of processing different types of image data, and Ostromoukhov teaches the uses of clustered-dot dithering and dispersed-dot dithering for different types of image data, then clearly Ostromoukhov would have motivated one of ordinary skill in the art at the time of the invention to select between dithering techniques, as taught by Kanno, the dithering techniques being clustered-dot dithering and dispersed-dot dithering, each operating based on the type of image data to which they are best suited, as set forth by Ostromoukhov.

While the references must be considered in their entirety, this in no way requires a bodily incorporation of any of the embodiments set forth in the reference. The teachings relied upon in Ostromoukhov are in the Background of the Invention, and do not relate to the particular embodiments set forth in the

Detailed Description of the invention set forth in Ostromoukhov. There is nothing in Ostromoukhov that teaches that the clustered-dot dithering and dispersed-dot dithering cannot be used in the manner set forth by Examiner in the previous office action, dated 27 October 2005 and 02 November 2005.

Regarding page 8, lines 17-22: The obvious engineering design choice set forth in the rejection of claim 4 are based on logic and scientific principle (see MPEP §2144.02). The limitations specifically set forth in claim 4 is merely a precise setting for the threshold value, which would be an obvious engineering design choice given the system of Kanno in view of Ostromoukhov and Harrington. Applicant has not set forth any substantive reason why the specific setting of the threshold value recited in claim 4 is novel and non-obvious.

Regarding page 8, line 23 to page 9, line 3: Since all pending claims have been demonstrated to be obvious in view of the prior art, all of the claims are rejected. The new grounds of rejection set forth below have been necessitated by the present amendments to the claims.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. **Claims 10, 11 and 14 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.**

Claims 10, 11 and 14 recite a recording medium which records a program. Thus, claims 10, 11 and 14 simply recite a

program listing. Claims 10, 11 and 14 do not in and of themselves produce any concrete, tangible and useful result. Claims 10, 11 and 14 do not recite any process, machine, article of manufacture, or composition of matter, and are thus non-statutory.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1, 8, 10 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanno (US Patent 4,998,122) in view of Ostromoukhov (US Patent 5,438,431).

Regarding claims 1 and 10: Kanno discloses detecting a predetermined property of a line-like part (figure 9(A,B,C) of Kanno) of the halftone image (column 4, lines 15-20 of Kanno); and processing the line-like part of the halftone image by a first dithering technique (column 5, lines 3-6 and lines 21-27 of Kanno) or a second dithering technique (column 9, lines 36-43 of Kanno) according to the predetermined property of the line-like part (column 4, lines 19-22 of Kanno), wherein the predetermined property includes both the thickness and the density of the line-like parts (column 5, lines 25-27 of Kanno) so that when the line-like part is of a thickness smaller than a first threshold value (column 9, lines 39-43 of Kanno) and at the same

time of a density higher than a second threshold value (column 4, lines 3-7 and lines 15-22 of Kanno), the part is processed by the second dithering technique (column 9, lines 36-43 of Kanno) and otherwise the part is processed by the first dithering technique (column 5, lines 21-27 of Kanno). If the line-like part is bold (column 5, lines 25-27 of Kanno), then said line-like part clearly has greater thickness than if said line-like part is not bold. If the line-like part is a character, then the line-like part is thicker than a photograph region and a low-contrast region (column 4, lines 3-7 and lines 15-22 of Kanno). The point at which the method taught by Kanno considers the line-like part to be bold is the first thickness threshold and the point at which the method taught by Kanno considers the line-like part to be a character (and not a bold character or low-contrast character) is the second thickness threshold.

Kanno does not disclose expressly that said halftone image is a halftone color image; that said first dithering technique is a clustered dot dithering technique; and that said second dithering technique is a dispersed dot dithering technique.

Ostromoukhov discloses, as part of the discussion of the prior art, a halftone color image (column 1, lines 16-23 of Ostromoukhov); a clustered dot dither technique (figure 3 and column 1, line 63 to column 2, line 4 of Ostromoukhov); and a dispersed dot dithering technique (figure 4 and column 1, lines 40-47 of Ostromoukhov). Clustered dot dithering does not render the smaller image details very well (figure 1 and column 2, lines 4-7 of Ostromoukhov) and dispersed dot dithering is better for rendering the smaller image details (column 1, lines 45-47 of Ostromoukhov), but can have certain banding artifacts (figure 2 and column 1, lines 50-54 of Ostromoukhov).

Kanno and Ostromoukhov are combinable because they are from the same field of endeavor, namely digital image data dithering and processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to be able to select between at least two dithering techniques, as taught by Kanno, wherein said first dithering technique taught by Kanno is the clustered dot dithering technique taught by Ostromoukhov, and wherein said second dithering technique taught by Kanno is the dispersed dot dithering technique taught by Ostromoukhov. The clustered dot dithering technique has advantages for a particular type of image data, specifically image data that only requires a restricted number of grayscale levels (column 1, line 63 to column 2, line 4 of Ostromoukhov), such as text, line data, and the like. While the clustered dot dithering technique does not render small image details well (column 2, lines 4-7 of Ostromoukhov), the dispersed dot dithering technique does render small image details well (column 1, lines 45-47 of Ostromoukhov). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the system taught by Kanno to switch between the clustered dot and dispersed dot dithering techniques taught by Ostromoukhov, depending upon the type of image data encountered. The motivation for doing so would have been that the different dithering techniques provide good results, along with some associated artifacts, for different types of image data (column 1, lines 45-47 and lines 50-54; and column 2, lines 4-7 of Ostromoukhov). Further, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to perform the image processing method on a color image, as taught by Ostromoukhov. The suggestion for doing so would have been that each color plane

can be processed as an individual halftone image (column 1, lines 16-23 of Ostromoukhov). Therefore, it would have been obvious to combine Ostromoukhov with Kanno to obtain the invention as specified in claims 1 and 10.

Further regarding claim 10: Kanno teaches using a recording medium in which a program for carrying out the method is recorded (column 4, line 66 to column 5, line 2 and column 8, lines 28-33 of Kanno).

Regarding claim 8: Kanno discloses an apparatus (figure 1 of Kanno) comprising a selecting means (figure 1(9) of Kanno) which selects a first dithering technique (column 5, lines 3-6 and lines 21-27 of Kanno) or a second dithering technique (column 9, lines 36-43 of Kanno) according to the predetermined property of a line-like part (figure 9(A,B,C) of Kanno) of the halftone image (column 4, lines 15-22 of Kanno); and a processing part (figure 1(10) of Kanno) which processes the line-like part of the halftone image by the technique selected by the selection means (column 5, lines 17-19 of Kanno).

Kanno does not disclose expressly that said halftone image is a halftone color image; that said first dithering technique is a clustered dot dithering technique; and that said second dithering technique is a dispersed dot dithering technique.

Ostromoukhov discloses, as part of the discussion of the prior art, a halftone color image (column 1, lines 16-23 of Ostromoukhov); a clustered dot dither technique (figure 3 and column 1, line 63 to column 2, line 4 of Ostromoukhov); and a dispersed dot dithering technique (figure 4 and column 1, lines 40-47 of Ostromoukhov). Clustered dot dithering does not render the smaller image details very well (figure 1 and column 2, lines 4-7 of Ostromoukhov) and dispersed dot dithering is better

for rendering the smaller image details (column 1, lines 45-47 of Ostromoukhov), but can have certain banding artifacts (figure 2 and column 1, lines 50-54 of Ostromoukhov).

Kanno and Ostromoukhov are combinable because they are from the same field of endeavor, namely digital image data dithering and processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to be able to select between at least two dithering techniques, as taught by Kanno, wherein said first dithering technique taught by Kanno is the clustered dot dithering technique taught by Ostromoukhov, and wherein said second dithering technique taught by Kanno is the dispersed dot dithering technique taught by Ostromoukhov. The clustered dot dithering technique has advantages for a particular type of image data, specifically image data that only requires a restricted number of grayscale levels (column 1, line 63 to column 2, line 4 of Ostromoukhov), such as text, line data, and the like. While the clustered dot dithering technique does not render small image details well (column 2, lines 4-7 of Ostromoukhov), the dispersed dot dithering technique does render small image details well (column 1, lines 45-47 of Ostromoukhov). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the system taught by Kanno to switch between the clustered dot and dispersed dot dithering techniques taught by Ostromoukhov, depending upon the type of image data encountered. The motivation for doing so would have been that the different dithering techniques provide good results, along with some associated artifacts, for different types of image data (column 1, lines 45-47 and lines 50-54; and column 2, lines 4-7 of Ostromoukhov). Further, at the time of the invention, it would

have been obvious to a person of ordinary skill in the art to perform the image processing method on a color image, as taught by Ostromoukhov. The suggestion for doing so would have been that each color plane can be processed as an individual halftone image (column 1, lines 16-23 of Ostromoukhov). Therefore, it would have been obvious to combine Ostromoukhov with Kanno to obtain the invention as specified in claim 8.

Regarding claims 12, 13 and 14: Kanno discloses that said predetermined property includes both the thickness and the density of the line-like parts (figure 9(A-C) and column 6, lines 41-51 of Kanno) and detection of the line-like part of the image is carried out using attribute data received from software (column 5, lines 7-14 of Kanno). The specific image type is determined (column 6, lines 41-51 of Kanno), which includes character (figure 9(A) of Kanno), low-contrast character (figure 9(B) of Kanno), and bold character (figure 9(C) of Kanno). The difference between a bold character and a character is a difference between the thickness, since both a character and a bold character are completely black. The difference between a character and a low-contrast character is one of density since, in order to be low-contrast, a character must be of a grayscale value that is not completely black, and thus of a lower contrast with the background than either the character or bold character.

7. Claims 2-3, 7, 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanno (US Patent 4,998,122) in view of Ostromoukhov (US Patent 5,438,431) and Harrington (US Patent 5,153,576).

Regarding claims 2, 9 and 11: Kanno does not disclose expressly that the halftone color image is printed in monochrome by a printer which is not higher than 600 dpi in resolution.

Ostromoukhov discloses printing on a printer (column 1, lines 8-12 of Ostromoukhov) which is not higher than 600 dpi in resolution (column 2, lines 1-4 of Ostromoukhov).

Kanno and Ostromoukhov are combinable because they are from the same field of endeavor, namely digital image data dithering and processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to print on a medium resolution printer, as taught by Ostromoukhov. The motivation for doing so would have been that clustered dot dithering does not render small details well (column 2, lines 4-7 of Ostromoukhov). Therefore, it would have been obvious to combine Ostromoukhov with Kanno.

Kanno in view of Ostromoukhov does not disclose expressly that the halftone color image is printed in monochrome.

Harrington discloses printing a halftone color image in monochrome (figure 2; column 2, lines 45-48 and column 4, lines 30-34 of Harrington).

Kanno in view of Ostromoukhov is combinable with Harrington because they are from the same field of endeavor, namely digital image data dithering and processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to print the halftone color image taught by Ostromoukhov in monochrome, as taught by Harrington. The

motivation for doing so would have been to be able to print on black-and-white printers, which are cheaper to print with (column 1, lines 16-20 of Harrington). Therefore, it would have been obvious to combine Harrington with Kanno in view of Ostromoukhov to obtain the invention as specified in claims 2, 9 and 11.

Regarding claim 3: Kanno discloses that the predetermined property is thickness of the line-like part (column 5, lines 25-27 of Kanno) so that when the line-like part is of a thickness larger than a threshold value, the part is processed by the first dithering technique (column 5, lines 21-27 of Kanno) and when the part is of a thickness not larger than the threshold value, the part is processed by the second dithering technique (column 9, lines 36-43 of Kanno). If the line-like part is bold (column 5, lines 25-27 of Kanno), then said line-like part clearly has greater thickness than if said line-like part is not bold. The point at which the method taught by Kanno considers the line-like part to be bold is the thickness threshold. Further, as discussed above in the arguments regarding claims 1 and 10, the first dithering technique is the clustered dot dithering technique and the second dithering technique is the dispersed dot dithering technique.

Regarding claim 7: Kanno discloses that two series of brush patterns are respectively prepared in advance for the first dithering technique and the second dithering technique (figure 3; column 4, line 66 to column 5, line 5; and column 9, lines 65-68 of Kanno), each series of brush patterns being prepared according to the density of the line-like part (column 4, lines 58-64 of Kanno), and the first dithering technique and the second dithering technique are carried out by the use of the

brush patterns selected (column 4, lines 15-21 of Kanno) according to the density of the line-like part (column 4, lines 42-47 of Kanno). Dithering matrices (figure 3 of Kanno) are stored in memory for use (column 4, line 66 to column 5, line 5 of Kanno) depending upon the selection results (column 9, lines 65-68 of Kanno). Further, as discussed above in the arguments regarding claims 1 and 10, the first dithering technique is the clustered dot dithering technique and the second dithering technique is the dispersed dot dithering technique.

8. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kanno (US Patent 4,998,122) in view of Ostromoukhov (US Patent 5,438,431), Harrington (US Patent 5,153,576), and obvious engineering design choice.

Regarding claim 4: Kanno in view of Ostromoukhov and Harrington does not disclose expressly that the threshold value is a value corresponding to 4 dots. However, 4 dots would clearly be one value which the line-like part could be considered bold. Some particular value must be selected as a threshold in order to operate the system taught by Kanno in view of Ostromoukhov and Harrington. Therefore, a threshold value of 4 dots is a mere engineering design choice.

9. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kanno (US Patent 4,998,122) in view of Ostromoukhov (US Patent 5,438,431), Harrington (US Patent 5,153,576), and Hines (US Patent 6,034,782).

Regarding claim 6: Kanno in view of Ostromoukhov and Harrington does not disclose expressly that the method is carried out by a printer driver.

Hines discloses carrying out digital image data dithering using a printer driver (column 3, lines 23-27 of Hines).

Kanno in view of Ostromoukhov and Harrington is combinable with Hines because they are from the same field of endeavor, namely digital image data dithering and processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use a printer driver to perform image data dithering, as taught by Hines, wherein the image data dithering method used is the method taught by Kanno in view of Ostromoukhov and Harrington. The motivation for doing so would have been that a printer driver is a typical piece of printing software that is used in dithering and halftoning images in a printing system. Therefore, it would have been obvious to combine Hines with Kanno in view of Ostromoukhov and Harrington to obtain the invention as specified in claim 6.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Thompson whose telephone number is 571-272-7441. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K. Moore can be reached on 571-272-7437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

James A. Thompson
Examiner
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27 June 2006

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